DETERMINATION OF THE DENSITY OF THE STREET-ROAD NETWORK OF THE CITY OF KHIVA

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Abstract

In this article, the determination of the density of the street-road network of the city of Khiva is carried out using mathematical models, and zoning models of the density of the street-road network in the neighborhood section of the city are developed, and suggestions and recommendations are presented to improve the efficiency of the density of the city's street-road network.

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Introduction.

The main purpose of the city street-road network is to meet the needs of the population and the needs of production through the services of motor vehicles, to ensure the operation of all types of motor vehicles, the safety and convenience of any cargo transportation and circulation, passenger transportation and circulation, as well as to ensure that it is based on the normative documents of urban planning. Taking into account the geographical structure (relief) of the urban areas, the street network is selected in accordance with the modern requirements of providing comfortable and safe movement.

Materials and methods.

Today, as a result of the increase in the mobility of the population, the increase in the demand for the service of vehicles, the increase in the types of vehicles and the speed of their movement, the rapid growth of urban infrastructures, experimental research are conducted on a large scale in street-road networks, as well as the re-development and implementation of their results created the need for large-scale research, such as the creation of mechanisms. Many scientists have conducted scientific researches on the planning, design and modernization of the density of city street networks [1,2,3,4,5,6,7].

It should be noted that the last 20-25 years have been a period of revolutionary changes in the design of the street network. The spread of sustainable development concepts in urban planning has had a strong impact on design solutions, including parameters related to urban areas, in particular, transportation system design. The scheme of the main street-road network of the city of Khiva is presented in (Fig. 1).

Figure 1. Technical and economic indicators of existing state and local roads and streets in the city

Throughout the khorezm region, especially in the city of Khiva, the volume of cargo transportation and passenger traffic is steadily growing, as a result, the volume of motor vehicles in the historical city is increasing year by year. Due to the increase in the number of vehicles, the road networks cannot accommodate the cars. One of the main indicators that determine the level of development of transport infrastructure using the experience of global urban planning is the density (S) of the city's street-road network. This indicator is characterized by the ratio of the street-road network to the city area [8].

The density of the street-road network is determined using the following formula:

$$S = \frac{L}{F} \ (1)$$

where: S is the density of the street-road network, km/km^2;

L- the total length of the street-road network, km;

F- the area of the urban area, km^2.

Results.

In the research of the street-road network system of the historical city of Khiva, the lengths of the street-road network of the city of Khiva are listed in Table 1. Using the formula (1), the existing parameters of the street-road network can be divided into the road transport areas of the city of Khiva in an expanded system. As a result of the division, the transport zoning in an enlarged format was carried out taking into account the uniformity, functional purpose, and typology of the transport scheme. General indicators of transport zoning and street-road network improvement are presented as follows (Table 1).

Table 1. General indicators of the improvement of the street-road network of the city of Khiva

№	Neighborhood citizens' assembly	Main KYT length (km)	Field km^2	density of the street road network(SRND)	Population as of January 2023	Utility SRND (with domestic SRND)	Population corresponding to 1-km SRND
1	Total for kumyaska neighborhood	4,38	0,53	8,2	2736	11,53	237
2	Total for Sangar neighborhood	9,54	1,72	5,6	5280	27,42	193
3	Total for new life neighborhood	6,75	0,56	12,1	3871	18,41	210
4	Total for Kalta minor neighborhood	4,53	0,53	8,6	3529	11,05	319
5	Total for Dostlik Makhala	4,33	0,48	9,1	4310	10,01	431
6	Total for Gulistan neighborhood	13,45	2,92	4,6	9424	51,77	182
7	Total for Mevaston neighborhood	4,2	0,53	7,9	2065	13,12	157
8	Total for the new residential area	4,59	0,90	5,1	2950	10,74	275
9	Total for Lolazor neighborhood	16,4	6,09	2,7	9131	53,92	169
10	Total for Old Qiyat neighborhood	31,23	5,56	5,6	8428	55,61	152
11	Total for Shihlar neighborhood	11,02	1,39	7,9	4575	29,21	157
12	Total for the district of Kaptarkhana	3	0,29	10,4	2686	7,28	369
13	Total by Binokor neighborhood	3,24	0,67	4,9	3620	15,49	234
14	Total for Guliraykhan neighborhood	12,35	1,85	6,7	7894	26,55	297
15	Khiva city, Tozabog district, total for this	2,8	0,43	6,5	3270	13,93	235
16	Khiva city Qibla Tozabog neighborhood total on this	9	1,59	5,7	3423	20,95	163
17	Khiva city Angariq neighborhood total in this regard	7,97	3,85	2,1	3944	23,77	166
18	Khiva city Gilamchi neighborhood total on this	4,15	0,23	18,3	3115	8,48	367
19	Gazchi neighborhood of Khiva city is the total for this	3,92	0,37	10,6	2555	8,84	289

20	Khiva city Ichon Qala neighborhood total in this regard	7,6	0,38	20,0	2450	13,28	184
21	Khiva city Gulshan 2 neighborhood total in this regard	37,64	3,44	10,9	5990	52,84	113
The average of the city of Khiva		-	-	8,3	-	23	233

The average density of the street-road network in Khiva is 8.3 km/km^2, and in "Ikhon-Kala" neighborhood, which is considered the historical center of the city, this indicator is 20 km/km^2. we can see in the picture, "Angarik" neighborhood, which made the smallest value, was 2.1 km/km^2, and this indicator corresponded to the requirements of the norm specified in [9].

The distribution of the density of the street-road network of the city of Khiva by integrated transport areas is presented in (Fig. 2).
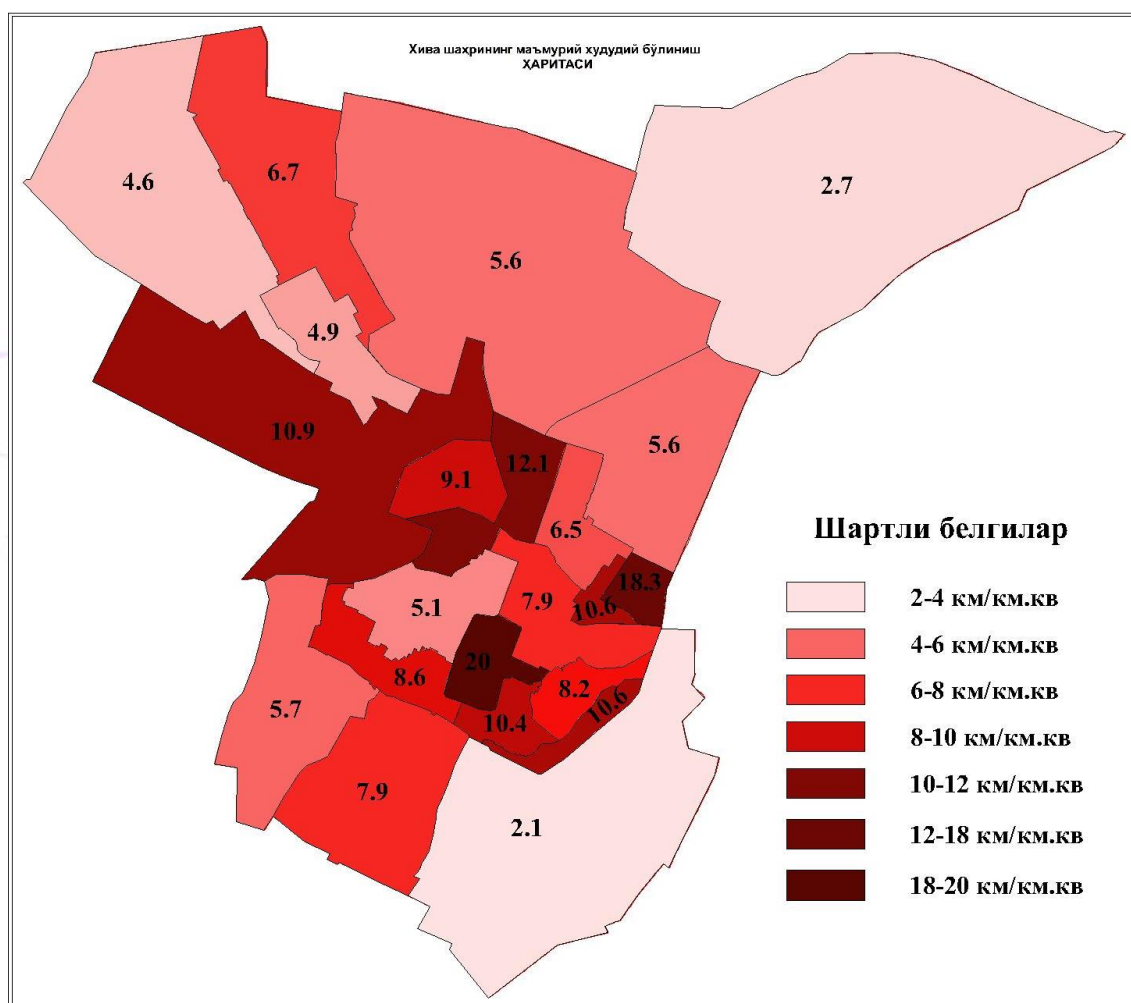

Figure 2. The street network of the integrated city of Khiva is divided into neighborhoods

The analysis of the specific length of the street-road network in relation to the population showed that in the city of Khiva, this indicator constituted an average of 233 street-road networks per 1 km of the population, the highest indicator was 431 streets per 1 km of the population corresponding to the "Dostlik" neighborhood. the road network is the distance, and the smallest indicator is the "Gulshan 2" neighborhood with 1 km of street-road network per 113 inhabitants. The distribution of the specific length of the street-road network in relation to the population in the city of Khiva is presented as follows (Fig. 3).
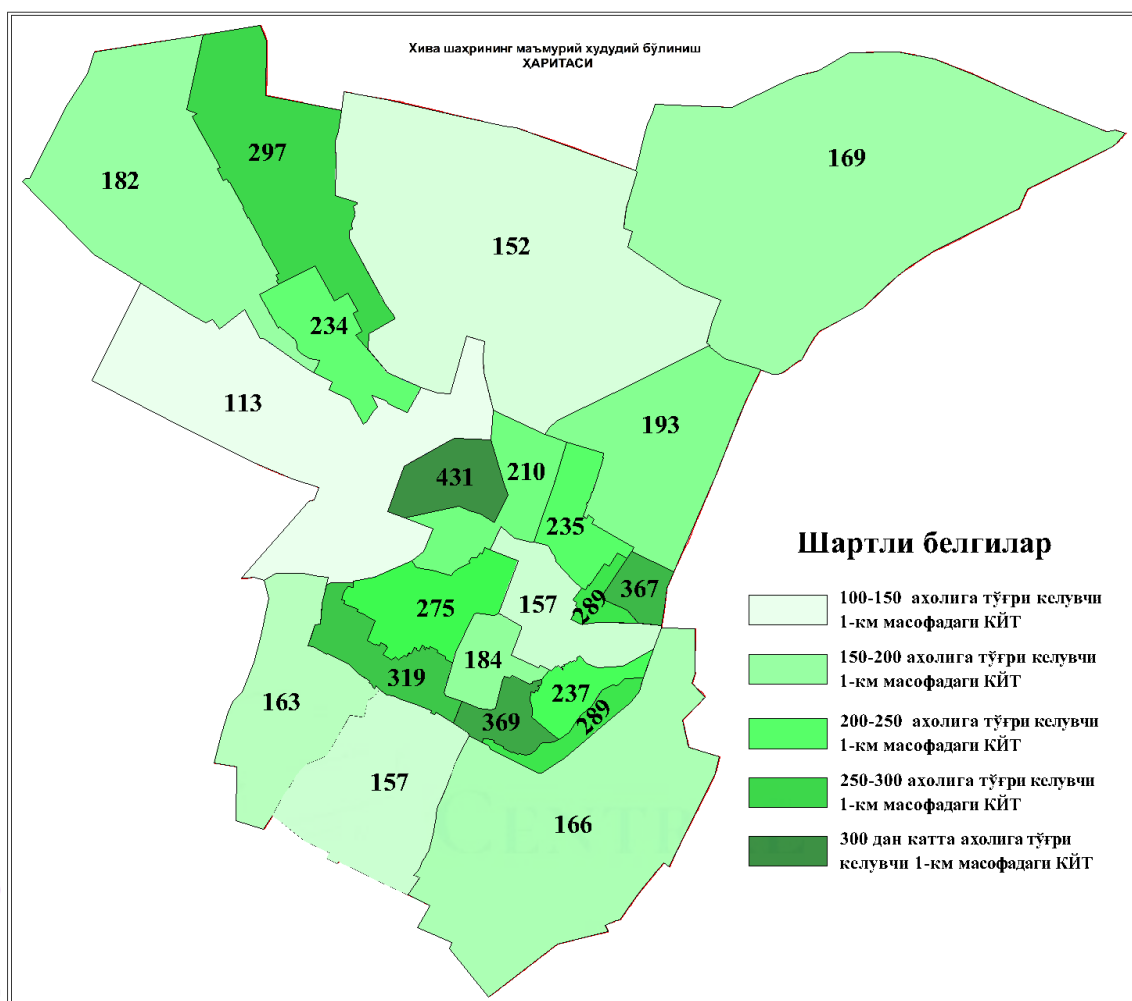
Figure 3. Distribution of the specific length of the street-road network in relation to the population

Conclusion.

The density of the street network in many neighborhoods of the city, the presence of agricultural fields in the neighborhood areas, the separation of the historical city of Hiva from the Khiva district in 2017, and the density of the city street network increase the capacity of motor vehicles in the city, on the other hand, a very large capital requires funds, and on the third hand, the one-way movement of the main streets of the street-road network reduces the coefficient of effective use of land areas, which are considered valuable in urban development.

Taking into account the above, the street-road network of the integrated city of Khiva with the correct distribution of the density of the street-road network is divided into neighborhoods and how many inhabitants are 1 km. it is necessary to develop measures according to the regulatory documents on the alignment of the street-road network in the distance.

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